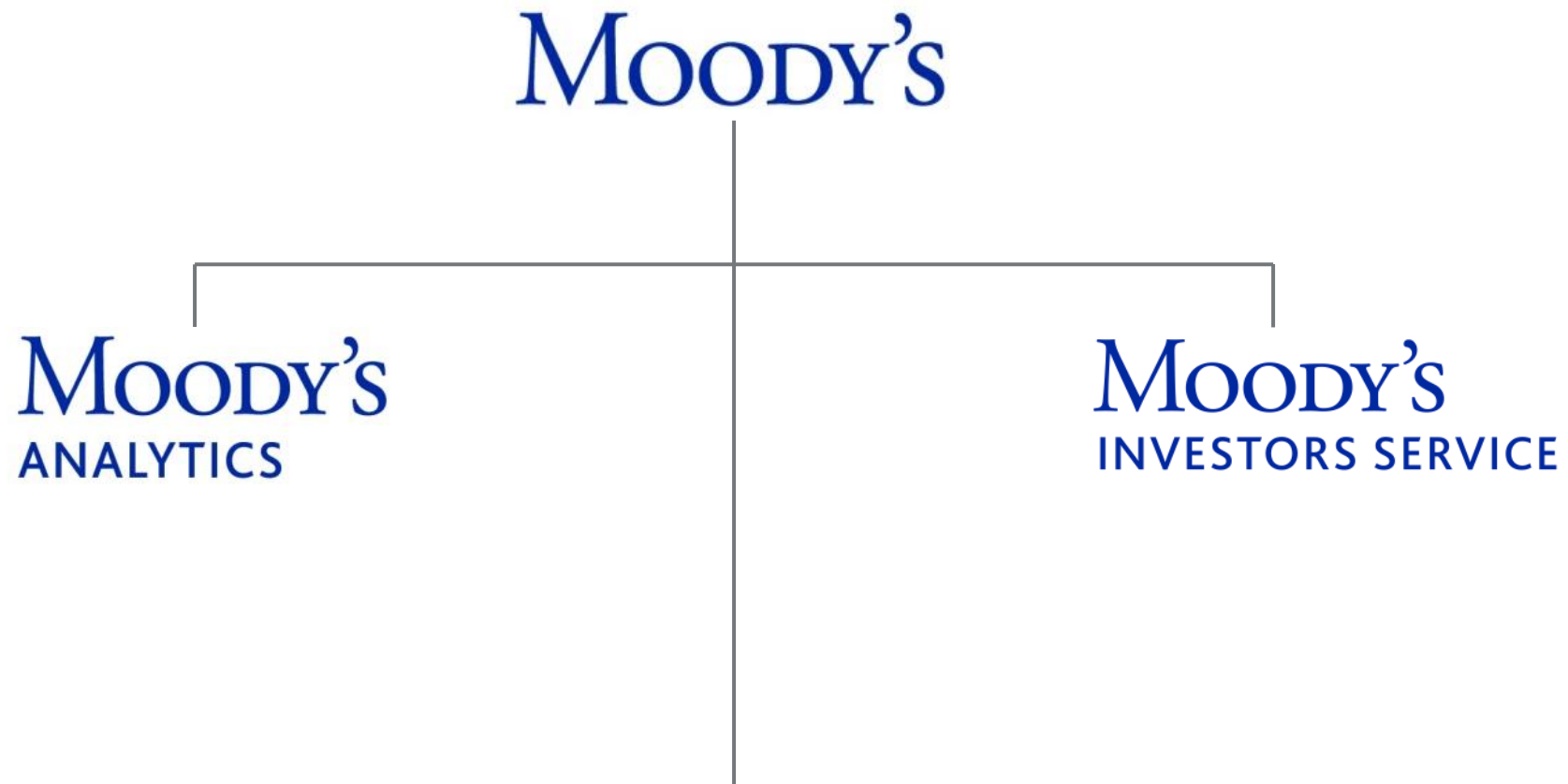
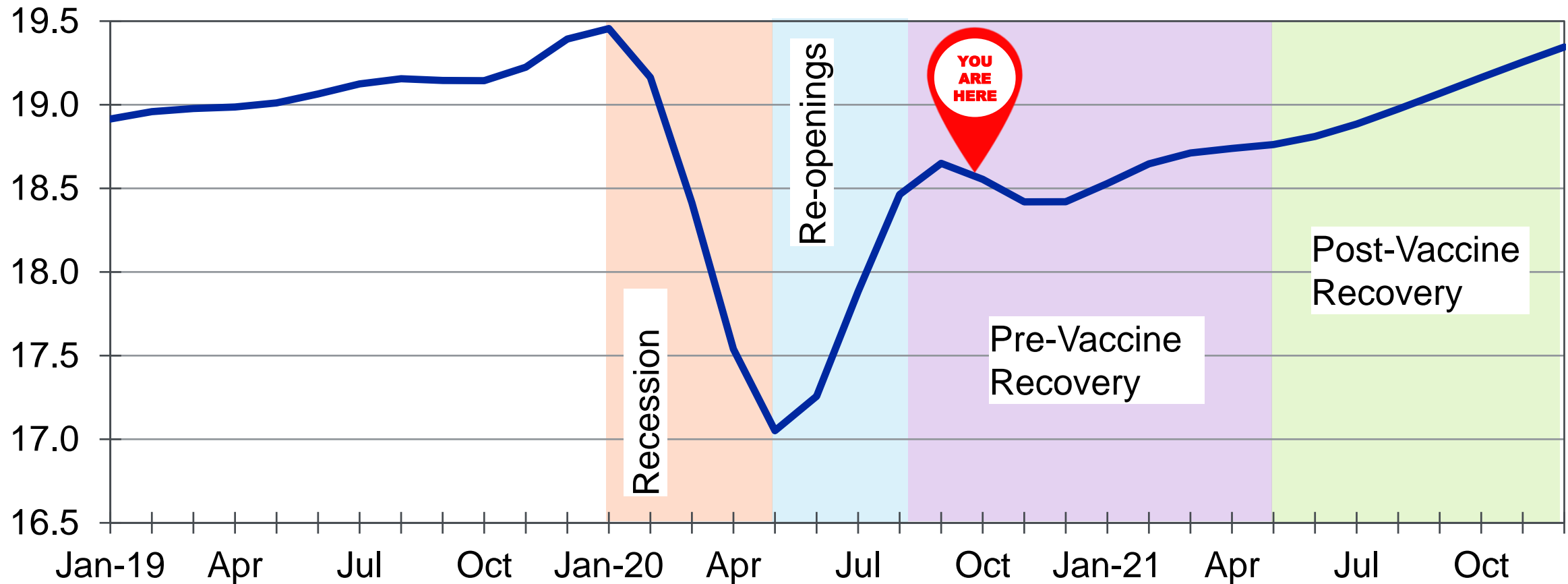


Budgeting for a Pandemic Economy



The Pandemic Economy Roadmap

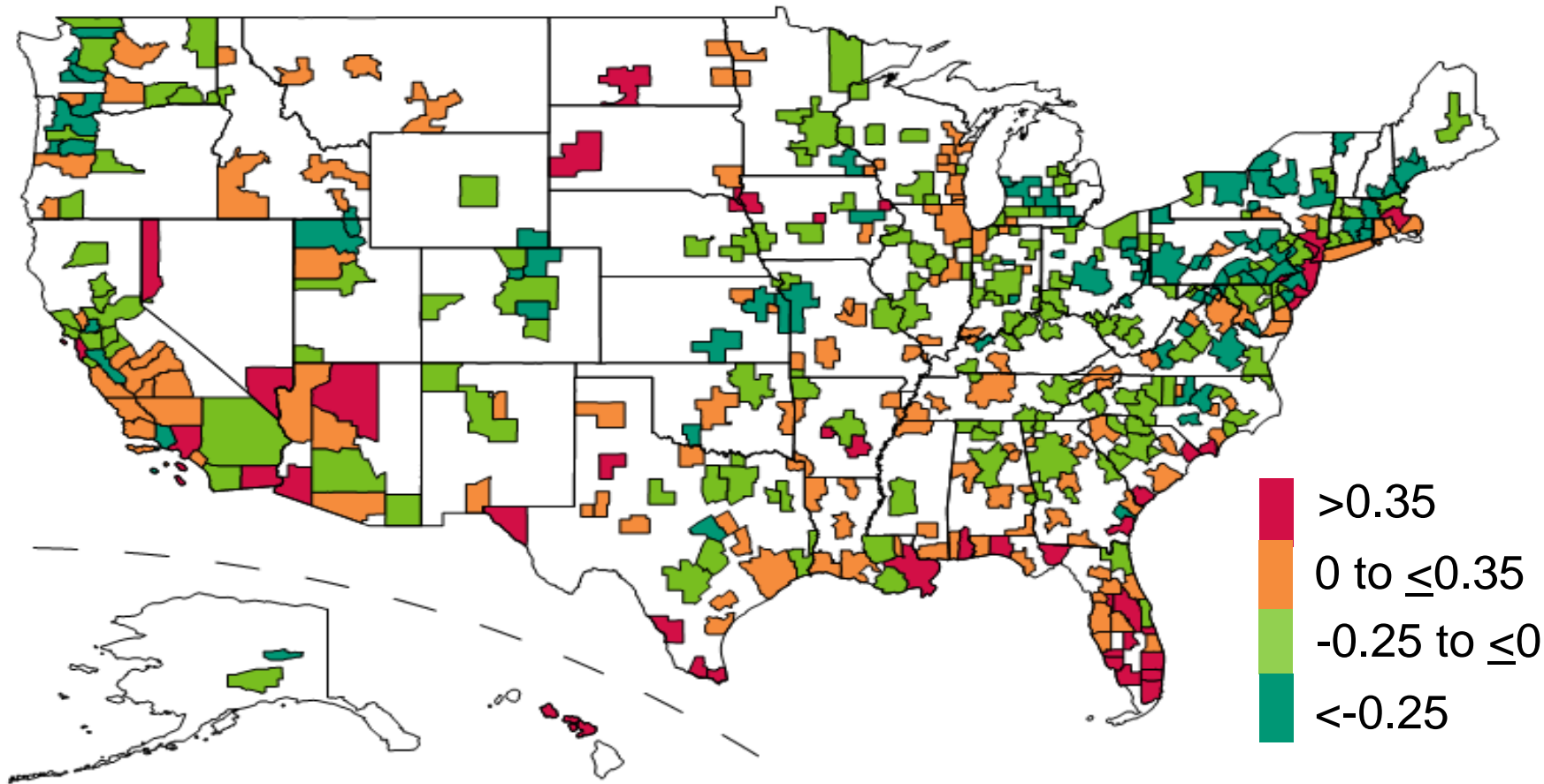
U.S. Real GDP, Moody's Analytics Baseline Scenario, Trillions 2012\$, SAAR



Sources: BEA, Moody's Analytics

Where the Economy Is Most Vulnerable

COVID Economic Exposure Score, 0=metro area avg, Nov 2020



MA Economic Exposure Score Key Components:

- Previous infections
- Demographics
- Commuting patterns
- Population density
- Industrial mix
- Income levels

Source: Moody's Analytics

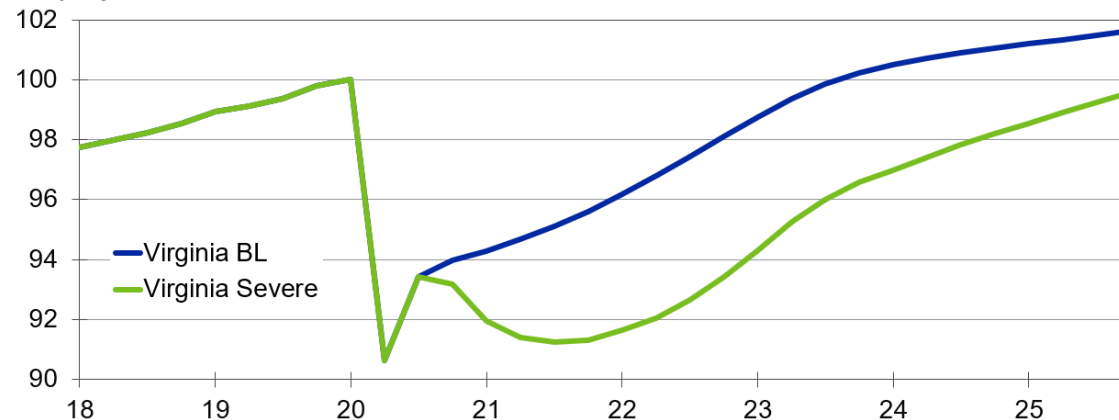
Virginia Ahead of the Game, But...

Better Than Most...

- Job losses have been less severe than other states thus far in the business cycle.
- Information, construction, and transportation hiring has been the biggest difference maker versus the rest of the country.
- Only material underperformance since February has come in education and healthcare.

Lengthy Recovery Ahead

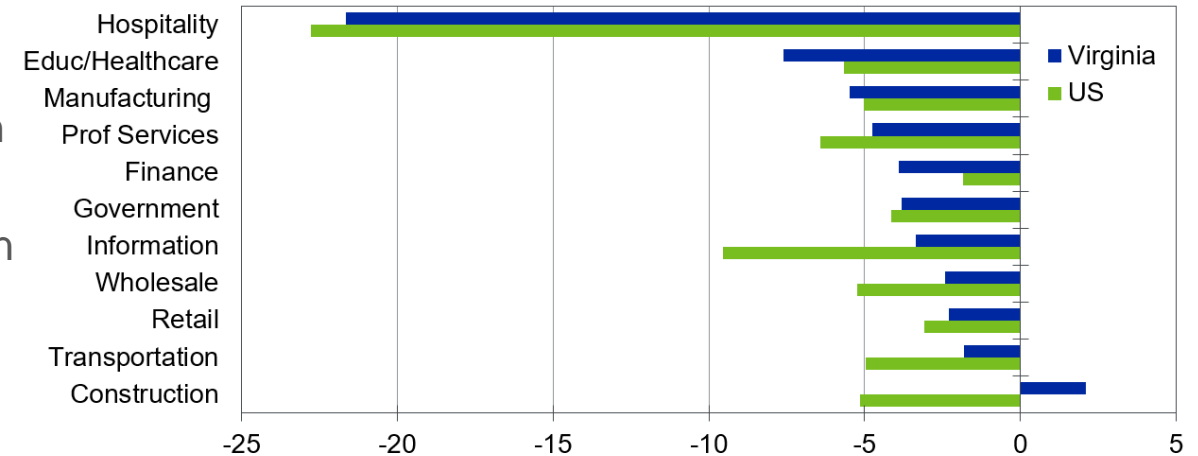
Employment, 2020Q1=100



Sources: BEA, Moody's Analytics

Hospitality Leading Declines

% change in jobs from Feb 2020 by industry, Sep 2020



Sources: BLS, Moody's Analytics

...But a Long Way Home

- No industry has suffered as much as the airlines thus far into the pandemic.
- The pace of recovery ultimately depends on the timing of an eventual vaccine, and how soon it gains acceptance from a majority of Americans.

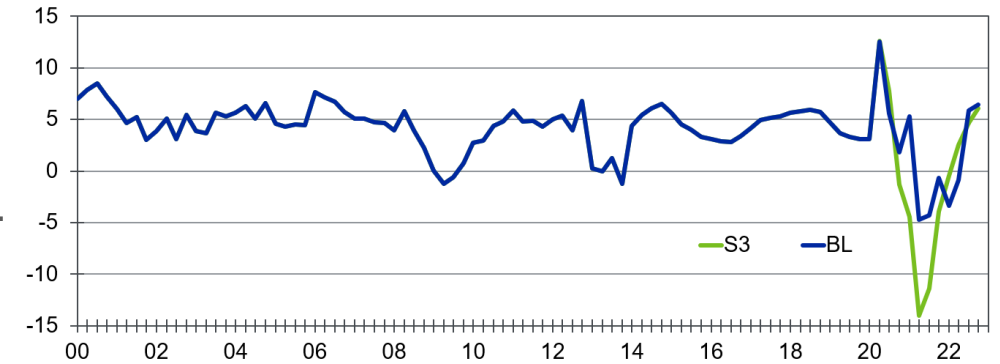
Important Forecast Assumptions and Risks

Stimulus Assumptions Are Key

- Federal fiscal stimulus has helped to buoy personal income thus far into the recession, offsetting some potential revenue weakness.
- Expiration of key income assistance measures like enhanced UI represent a major difference in our baseline and downside scenarios.
- Knock-on effects from lower consumer spending would prolong the recession well beyond FY22 in most states.

Incomes Drive Revenue Forecast

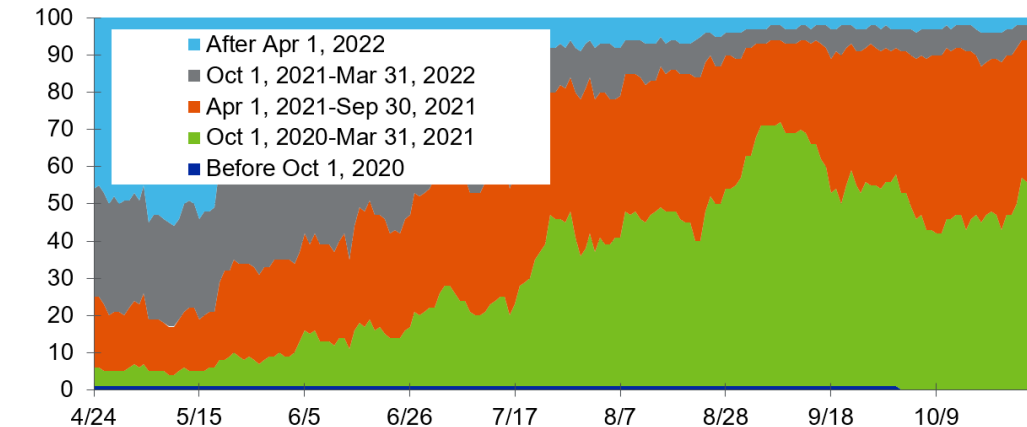
U.S. disposable personal income, % change yr ago



Sources: BEA, Moody's Analytics

Vaccination Availability

Probability, timeframe for 25 million inoculations in the U.S. (10/29)



Sources: Good Judgment Project, Moody's Analytics

Vaccine Roll-out AND Acceptance

- Baseline assumes a vaccine is released in mid-2021, with relatively widespread acceptance by next fall.
- It will take time to get Americans comfortable with any vaccine and to accelerate to a normal pace of recovery.
- Any delay in this timeline would represent a significant downside risk to the outlook for both sales taxes and gaming percentage fees.

Budgeting in the Middle of a Pandemic:

As simple as nailing
Jell-O to a wall...



Keys for Planning Around COVID

1

“Use More Than One Nail”

Plan for more than one alternative scenario as part of your planning process. Help stakeholders understand the risks.

2

Identify Key Assumptions

Understand what assumptions are driving each scenario and which are the most important to budget outcomes.

3

Consider the Whole Picture

Make sure to include all of the factors that impact budget shortfalls, revenues AND spending.



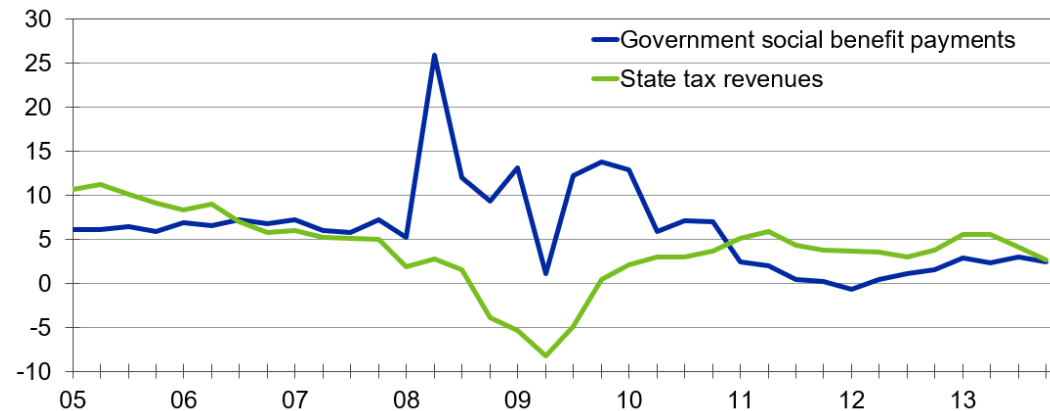
How We Plan for the Worst

Lower Revenues

- General fund revenues are modeled using stochastic equations for each state.
- Forecasts are stressed using Moody's Analytics' economic scenarios and historical data from NASBO.
- Comparing to rate of inflation estimates funds necessary to hold real spending constant, year over year.

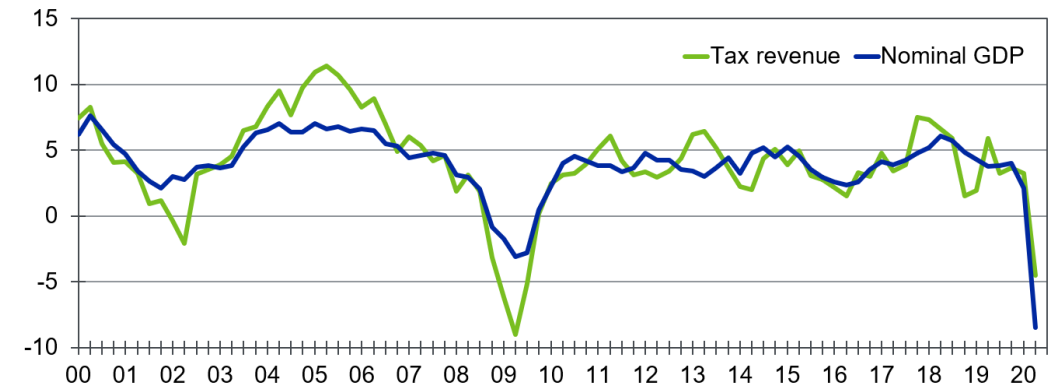
Recessions Affect Revenues AND Spending

State budgets during Great Recession, % change yr ago



Translating Private Pain Into Public Stress

% change yr ago, U.S.



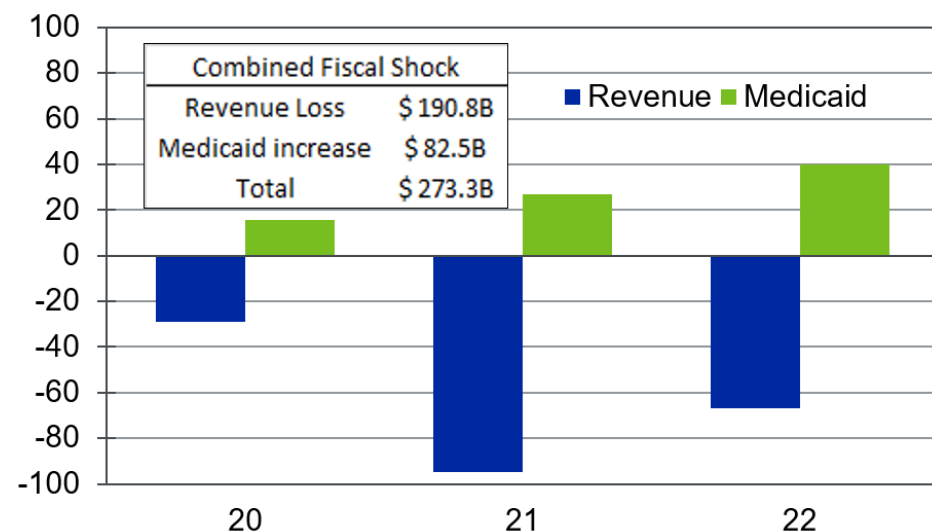
Sources: BEA, Moody's Analytics

Higher Costs

- Medicaid is used as a proxy for all state general fund mandatory spending impacts.
- Medicaid enrollment is modeled using stochastic equations based on Moody's Analytics economic scenarios and historical CMS data.
- Enrollment forecasts are combined with cost data from CMS and NASBO to establish spending shocks.

The Numbers

Aggregate fiscal shock across all 50 states, FY20 – FY22

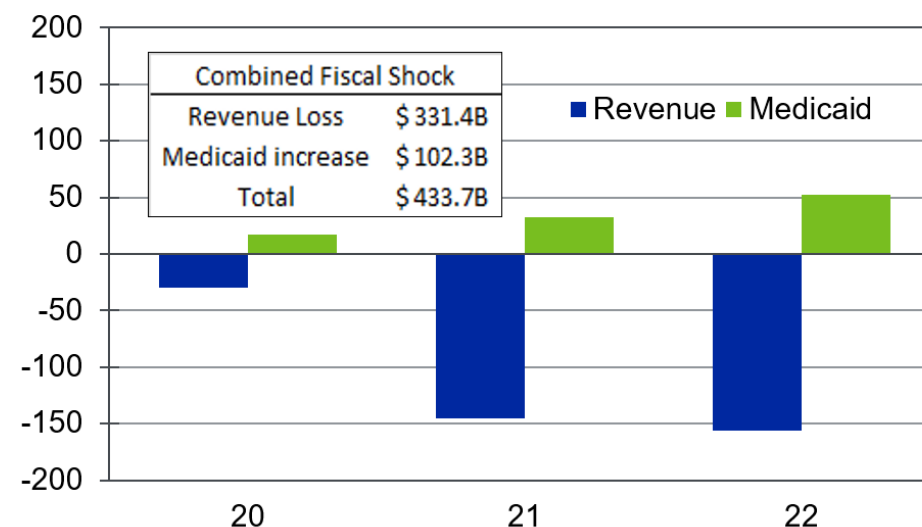


Severe

- Double-dip recession and delayed recovery extends the fiscal shock well beyond three fiscal years, with more stress in FY22 and beyond.
- Such a scenario would result in the largest state budget shortfalls since the Great Depression.
- When accounting for local governments the estimated shortfall grows to nearly \$650 billion.

Baseline

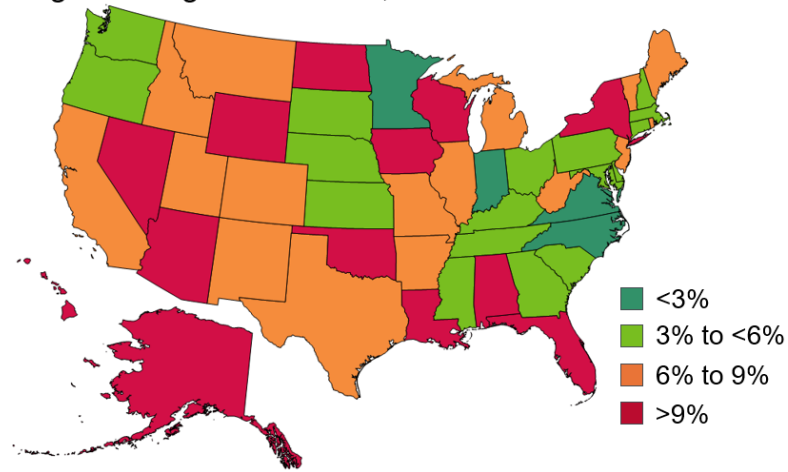
- Revenue losses and Medicaid surge are likely to extend across at least three fiscal years.
- Majority of the pain is concentrated in FY21, particularly for revenues, as the economy waits for an accepted vaccine.
- When accounting for local governments the estimated shortfall grows to nearly \$450 billion.



No Such Thing as an Average State (or Commonwealth)

Different Shocks

Avg annual gross shortfall, % of FY19 GF revenue



Sources: NASBO, Moody's Analytics

Cross State Differences

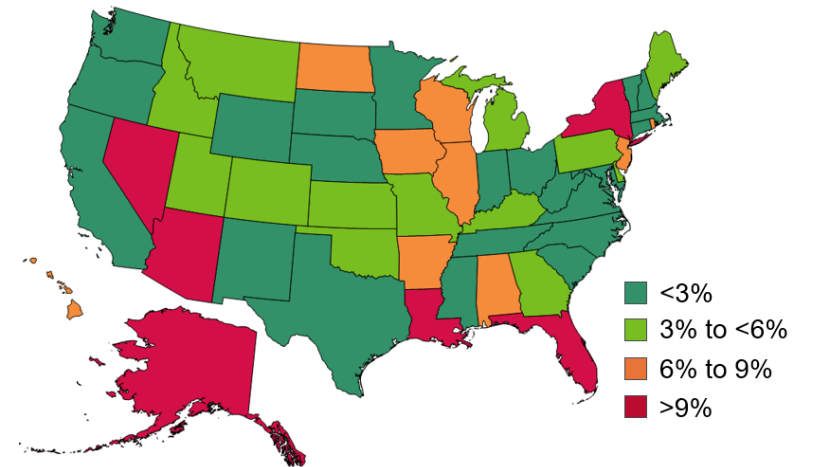
- Differentiation between states is greatly influenced by industry mix with those more reliant on leisure/hospitality, tourism, trade, and energy seeing the greatest relative impacts.
- Exposure to the virus also plays a large role. Those states with larger outbreaks have in turn imposed more severe business restrictions, choking off taxable activity.
- More volatile revenue sources like progressive income taxes and energy taxes also amplify shock.

Preparation Goes a Long Way

- After accounting for state reserves the average annual state shortfall from FY20 – FY22 falls to around 4.5% of FY19 revenues.
- A handful of states may be able to cover their entire shortfall from reserve accounts, though many more could still see double-digit shortfalls thanks to large shocks and under preparedness.

Different Levels of Preparation

Avg annual net shortfall, % of FY19 GF revenue



Sources: NASBO, Moody's Analytics

Dan White
Director of Public Sector Research
help@economy.com
@DanWhiteEcon

© 2020 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S INVESTORS SERVICE, INC. AND/OR ITS CREDIT RATINGS AFFILIATES ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED BY MOODY'S (COLLECTIVELY, "PUBLICATIONS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S INVESTORS SERVICE DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S INVESTORS SERVICE CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES ITS PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing its Publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it fees ranging from \$1,000 to approximately \$2,700,000. MCO and Moody's investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moodys.com under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any credit rating, agreed to pay to MJKK or MSFJ (as applicable) for credit ratings opinions and services rendered by it fees ranging from JPY125,000 to approximately JPY250,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.